George Washington International Law Review
ISSN-1534-9977, E-ISSN-0748-4305

Article Received: 13th May, 2021; Article Revised: 02nd June, 2021; Article Accepted: 15th June, 2021

IMPLICATIONS OF BANKING SECTOR ON ECONOMIC DEVELOPMENT IN INDIA

Bhadrappa Haralayya
Post-Doctoral Fellowship Research Scholar, Srinivas University, Mangalore, India
Orcid ID-0000-0003-3214-7261, bhadrappabhavimani@gmail.com

P. S. Aithal
Professor, College of Management and Commerce, Srinivas University, Mangalore, India
Orcid ID-0000-0002-4691-8736, psaithal@gmail.com

Abstract
Banking sector provides several facilities in a country. Financial activities of banking sector are crucial drivers to increase the socio-economic development. Subsequently, economic development increase as increase in efficiency of banking sector in a nation. Existing researchers used different indicators of banking sector to examine their impact on economic growth in developed and developing economies. In India, limited studies could examine the impact of banking sector on economic development. Therefore, this study assesses the impact of banking sector on per capita gross domestic product (GDP) in India using a time series data during 1981-2019. It used per capita GDP as dependent variable, and broad money as a % of GDP, broad money to total reserves ratio, domestic credit to private sector as a % of GDP, final consumption expenditure as a % of GDP, annual consumer prices inflation, literacy rate and real interest rate as independent variables. It applied linear, log-linear and non-linear regression models to estimate the regression coefficient of aforesaid variables with per capita GDP. The empirical results claimed that broad money to total reserve ratio, domestic credit to private sector, final consumption expenditure and literacy rate have positive impact on per capita GDP. Consumer price inflation and real interest rate have negative impact on per capita GDP in India. India needs to control high inflation and real interest rate to increase the demand of goods and services to strengthen the economic development. The estimates of the study clearly indicate that financial activities of banking sector play a vital contribution to increase economic development in India.
Keywords: Economic growth; Economic development; Per capita gross domestic product; banking sector; India.

1. Introduction

Financial institutions have a significant contribution to increase the socio-economic development of the people in several ways (Joshi, 2017). Furthermore, economic development depends upon efficient financial institutions of a nation (Sharma et al., 2012). Hence, financial development is useful to increase demand of goods and service, thus it plays an effective role to sustain the economic growth of a nation (Liang and Reichert, 2006). Banking is a financial organization which act as intermediary between lenders and creditors (Ruslan et al.,

2018; Jha, 2020). Banking sector is useful to convert deposits into productive investment, creating new capital and accelerate economic development (Tanwar et al., 2020). It is also conceptually proved the overall growth of an economy is significantly associated with the appropriate health of banking sector (Hafsal et al., 2020). Therefore, banking sector performs several activities such as accepting deposits from individual and business community and provide loans to the common people and business community (Kumari, 2017; Muniswamy, 2018). As banking sector accepts the small saving of common citizen and provide loans to the common people for various purposes. Furthermore, the banking institutions motivates people to deposit their small saving in banks. The banking institution also provides the short-term, medium-term and long-term loans to the business community in all sectors. Most importantly, it provides the direct financial support to the business community and farming community. Accordingly, it creates the employment opportunities in industry and agricultural sectors. Subsequently, demand of goods and services are expected to be increase as increase in the role of banking sector in an economy. Hence, banking institution is helpful to maintain the money flow and contribute to create physical assets in the economy. Banking sector is also effective to operate efficiency, provide sustainability in financial system and increase equitable economic growth through providing easy, safe and financing to the public (Ruslan et al., 2018). Furthermore, it also prepares the path for capital formation in a country. Consequently, banking sector have a crucial contribution towards economic development of a nation (Muniswamy, 2018; Kumar, 2019; Deb, 2019). Hamid et al. (2017) have argued the banking sector play important role to maintain economic development an economy. Kumar (2019) highlighted the banking sector play a significant role to sustain the economic stability of a nation. Bhatia and Mahendru (2015) have argued that efficient banking system contribute towards economic development. Efficient efficiency of banking sector is helpful to increases the mobilization of saving and deposits funds to increase economic growth (Karimzadeh, 2012). Rajan and Zingales (1998) claimed the efficient banking sector works as important driver to strengthen the economic growth through mobilization of financial saving and use these saving to create physical assets.

In India, banking system was established in 18th century and General Bank of India was founded in 1786 (Kumari, 2017). State Bank of India is an oldest bank which was setup in India in 1806 (Kumari, 2017; Muniswamy, 2018). The Reserve Bank of India (RBI) was nationalized on 01 April, 1935 (Kumari, 2017; Jha, 2020). In India, 14 commercial banks were nationalized and 4 other banks were also merged with other public sector banks (Jha, 2020). In India, the RBI govern and regulate the banking system. Indian banking sector can be divided in two broad categories i.e., scheduled and non-scheduled banks. All cooperative or commercial banks which are listed under 2nd schedule of the RBI Act, 1934 known as scheduled banks in India (Jha, 2020). Cooperative banks are registered under the Society Registration Act (Jha, 2020). Thereupon, commercial banks can be divided in four categorized i.e., public sector banks, private sector banks, foreign banks and regional rural banks (Jha, 2020). Public sector banks are the undertaking enterprises of Government of India. There are 12 public sector banks in India. Recently, Government of India has merged many public sector banks in order to strengthen their balance sheets (Jha, 2020). Private sector banks are privately held by individuals. There are many private banks such as ICICI banks, Axis Banks etc. have the private ownership of such types of banks in India (Jha, 2020). Foreign banks are registered in India as banks as per the requisite banking license from the RBI in India. The Government of India is established regional rural bank in order to increase the use of banking system by grass root level in rural area (Jha, 2020). Furthermore, there are small finance and payment banks in

India. Small finance banks are available in those areas where banks cannot reach for local people (Jha, 2020). Payment banks facilitate payments and remittances related activities in India (Jha, 2020).

As banking sector provided the financial support in economic disaster in Indian economy in different time spans (Sharma et al., 2012). Indian banking sector is financially stable and has the ability to resilient in phase of economic crisis (Sharma et al., 2012). Also, Thus, banking sector is the backbone of Indian economy due to several reasons. In India, banking sector includes public sector, private sector and foreign sector banks. While, public sector bank has control around 80% of the market (Kumari, 2017). Indian banking sector has 7.7% contribution in India's GDP (Singh and Malik, 2018). Thus, banking sector has a vital contribution economic development in India (Kumari, 2017). The commercial bank's credit as a percent of GDP increased from 23.6% in 2001 to 53% in 2015 (Ranajee, 2018). However, Indian banking sector is facing problem due to rising non-performing assets (NPAs) (Goyal et al., 2019). There are some other financial activities in banking sector which has positive and significant impact on economic growth and development. In this regards, in India, several studied have provided that the banking sector have a positive impact on economic development (Muniswamy, 2018; Tanwar et al., 2020). However, limited studied could provide the association of financial performance of banking sector with economic growth at national level in India. Furthermore, there are many research questions must be addressed by the exiting researchers which are given as:

- What types of services are providing by banking sector in India?
- What is role of banking sector in Indian economy in general?
- How financial activities of banking sector have a significant impact on economic development in India?
- What are the linkages of banking sector with economic development in India?

With regards to aforementioned research questions, the present study achieved following objectives:

- To examine the impact of banking sector on economic development in India based on existing studies.
- To assess the impact of financial activities of banking sector on economic development in India.

2. Review of Literature

2.1. Banking Sector and Economic Development

There are several ways in which banking sector promote economic growth and economic development. This section provides the role of banking sector in different activities of a nation.

Banking sectors in conducive to promote saving habits of the people for deposit in the banks for get better and safe return (Muniswamy, 2018). Capital formation works as blood for a nation. As banking sector collect deposits from depositors and provide collected amount to the people, business community, farmers and others as loans to earn profit. Thus, the banking sector is highly effective to create capital formation (Muniswamy, 2018). Banking institutions provides the loans to the business community to set up new industry and venture (Singh et al., 2019; Singh et al., 2020). Financial support from banking sector to small companies is useful to create start-up (Jyoti and Singh, 2020). Therefore, banking sector is useful to increase industrialization and entrepreneurship ecosystem (Singh and Ashraf, 2020; Singh and Jyoti, 2020). Appropriate banking sector is useful to make transfer of money for trade of goods and services through mobile banking, internet banking,

debit cards, credit cards and other (Muniswamy, 2018). The growth of Indian economy largely depends upon agricultural sector as the sector meet the food security of Indian. Banking sector provide short-term and long-term loans to the farmers for their farming activities. Subsequently, banking sector promote agricultural production (Kumar et al., 2017; Singh and Jyoti, 2021). As banking sector provide loans to the industry and business community. Therefore, it creates employment opportunities at grater scale (Muniswamy, 2018). Economic development may be adversely affected due to inflation, deflation and crisis. A monetary policy is useful to control inflation, deflation and crisis (Muniswamy, 2018). As monetary policy governs by central bank of nation, hence, banking sector has a significant contribution to maintain financial stability in a country.

2.2. Association of Banking Sector and Economic Development

At present banking sector in one of the biggest service providers sectors in India (Kumari, 2017). In India, banking sector is providing several services such as credit cards, debit cards, ATM services, telebanking, internet banking, electronic payments, consumer finance, life insurance, mutual fund, pension fund, regulation services, stock broking services (Kumari, 2017; Muniswamy, 2018). Accordingly, banking sector have a vital contribution to increase economic growth. Previous studied have theoretically and empirically proved that banking sector have a positive impact on economic growth. For instance, Muniswamy (2018) assessed the role of banks in capital formation and economic growth in India. Alam et al. (2021) have reported that interest margin and return on assets of banking sector have significant impact on economic growth in India. Al-Homaidi et al. (2018) have claimed that commercial banks dominate the financial system and have vital contribution in economic development. However, previous could not find uniform relationship between economic growth and banking sector. Saeed et al. (2018) reported positive bi-directional causality relationship between banking sector and economic growth in Pakistan. Joshi (2017) assessed the relationship between the financial development and growth in India.

3. Research Methodology

3.1. Explanation of Dependent and Independent Variables

Previous studies have also used different indicators such as gross domestic product, per capita gross domestic product and growth gross domestic product as a proxy for economic growth, economic development and economic proxy across countries (Liang and Reichert, 2006; Prochniak and Wasiak, 2016; Puatwoe and Piabup, 2017; Joshi, 2017; Al-Homaidi et al., 2018; Singh and Malik, 2018). Liang and Reichert (2006) used aggregate output or real GDP as dependent variable, and capital stock and financial sector development are used as independent variables. Hence, previous studies have used different indicators as proxy for financial or banking sector to examine their impact on economic growth and economic development in different countries. For instance, Prochniak and Wasiak (2016) examined the impact of financial sector on economic growth in 28 EU and 34 OECD countries during 1993 – 2013. This study is used economic growth as dependent variable, and bank non-performing loans, bank capital to assets ratio, market capitalization of listed companies, turnover ratio of stocks traded and monetization ratio as independent variables in regression model. Puatwoe and Piabup (2017) have assessed the implications of financial sector development and economic growth in Cameroon. Al-Homaidi et al. (2018) have considered the gross domestic product, inflation rate, interest rate and exchange rate to analysis banking performance in India. Guru and Yadav (2019) have examined the relationship between

financial development and economic growth in BRICS countries. This study is used macroeconomic indicators such as credit to deposit ratio, domestic credit to private sector, inflation, exports and enrolment in secondary education. Al-Homaidi et al. (2018) have used different macroeconomic indicators such as gross domestic product, inflation rate, interest rate, exchange rate and others to assess the macro-economic determinants of profitability of commercial banks in India. Saeed et al. (2018) have considered lending capability, innovation, interest margin and bank investment as proxy variables of banking sector to examine their impact on economic growth in Pakistan. Joshi (2017) have used M2 GDP ratio and ratio of stock market capitalization to GDP in India.

3.2. Empirical Model

As economic development may not be capture by a single variable of nation. Prior studied have used gross domestic product, per capita GDP and growth in gross domestic product as a proxy for economic development in empirical investigation (Singh and Malik, 2018). Therefore, per capita gross domestic product is used as proxy for economic development to assess its association with financial activities of banking sector in India in this study. Joshi (2017) have also used GDP per capita as a proxy for economic growth to assess its relationship with financial development in India. Broad money (% of GDP), domestic credit to private sector (% of GDP) and broad money to total reserves ratio are used to assess the impact of banking sector on per capita GDP in this study. Real interest rate (%) is an important driver to increase the attention of common people and business community to take the loan from banking sector (Al-Homaidi et al., 2018). Hence, it is expected that per capita GDP may decline as increase in real interest rate. Demand of goods and service may decline due to increase in consumer prices inflation (annual %) in a country. Subsequently, it is likely to be predicted that Final consumption expenditure decreases as increase in consumer price inflation. Hence, broad money (% of GDP), broad money to total reserves ratio, domestic credit to private sector (% of GDP), final consumption expenditure (% of GDP), consumer prices inflation (annual %), literacy rate adult total and real interest rate (%) are used as independent variables in this study. This study used time series data for above-mentioned variables during 1981-2019. All data is derived from official website of the World Bank (World Development Indicator). Linear, log-linear and non-linear regression models are used to assess the influence of aforesaid explanatory variables on per capita gross domestic product. Following linear regression model is used:

$$(GDPPC)_t = \beta_0 + \beta_1 (BPGDP)_t + \beta_2 (BMTRR)_t + \beta_3 (DCPSPGDP)_t + \beta_4 (FCEPGDP) + \beta_5 (CPI)_t + \beta_6 (LRAT)_t + \beta_7 (RIR)_t + u_t \quad (1)$$

Here, t is time period (1981-2019), β_0 is constant term; β_1, β_2, …, β_7 are the regression coefficient of associated explanatory variables; and u_t is the error term in equation (1). The explanation of variables is given in Table 1.

Table 1: List of dependent and independent variables

Variable	Symbol	Unit	Source of Data
GDP per capita (constant 2010 US$)	*GDPPC*	US $	World Development
Broad money (% of GDP)	*BPGDP*	Number	

Broad money to total reserves ratio	*BMTRR*	%	Indicator (World Bank)
Domestic credit to private sector (% of GDP)	*DCPSPGDP*	%	
Final consumption expenditure (% of GDP)	*FCEPGDP*	%	
Consumer prices inflation (annual %)	*CPI*	%	
Literacy rate adult total (% of people ages 15 and above)	*LRAT*	%	
Real interest rate (%)	*RIR*	%	

Log-linear regression model is used in following form:

$$ln(GDPPC)_t = \alpha_0 + \alpha_1\, ln(BPGDP)_t + \alpha_2\, ln(BMTRR)_t + \alpha_3\, ln(DCPSPGDP)_t + \alpha_4\, ln(FCEPGDP) + \alpha_5\, ln(CPI)_t + \alpha_6\, ln(LRAT)_t + \alpha_7\, ln(RIR)_t + \theta_t \quad (2)$$

Here, *ln* is natural logarithm of corresponding variables, α_0 is constant term; α_1, α_2, …, α_7 are the regression coefficient of associated explanatory variables; and θ_t is the error term in equation (2). Original and square term of all explanatory variables are considered in non-linear regression model. Non-linear regression model is used in following form:

$$(GDPPC)_t = \lambda_0 + \lambda_1\,(BPGDP)_t + \lambda_2\,(Sq.\ BPGDP)_t + \lambda_3\,(BMTRR)_t + \lambda_4\,(Sq.\ BMTRR)_t + \lambda_5\,(DCPSPGDP)_t + \lambda_6\,(Sq.\ DCPSPGDP)_t + \lambda_7\,(FCEPGDP)_t + \lambda_8\,(FCEPGDP)_t + \lambda_9\,(CPI)_t + \lambda_{10}\,(CPI)_t + \lambda_{11}\,(LRAT)_t + \lambda_{12}\,(LRAT)_t + \lambda_{13}\,(RIR)_t + \lambda_{14}\,(RIR)_t + \mu_t \quad (3)$$

Here, *Sq.* is square term of respective variables; λ_0 is constant term; λ_1, λ_2, …, λ_7 are the regression coefficient of associated explanatory variables; and μ_t is the error term in equation (3).

3.3. Process to Select an Appropriate Model

As this study is used a time series data of dependent and independent variables during 1981-2019. Therefore, it is necessary to check the normality, stationarity, unit root, autocorrelation, multi-correlation and heteroskedasticity in the time series data. Accordingly, skewness and kurtosis values of each variable is estimated the check the normality of the data (Singh and Jyoti, 2021). The existence of unit root in each variable of time series data is check through Augmented Dickey-Fuller (ADF) unit root test (Singh, 2017). Most variables are found stationarity in nature. Multi-correlation shows the linear relationship among the explanatory variables (Singh, 2017). Hence, the existence of multi-correlation is identified through variance inflation factor (VIF). Presence of autocorrelation is a prime problem of time series data (Singh, 2017). Therefore, Durbin-Watson d-statistics and Durbin's Alternative test is used to check the presence of autocorrelation in time series data. Cameron and Trivedi decomposition of IM-test, and Breusch-Pagan/Cook-Weisberg test are considered to identify the presence of heteroskedasticity in the time series data (Singh, 2017). Since, this study is used linear, log-linear and non-linear regression models, thus, *Ramsay RESET* test is used to check the well-defined function form of empirical model (Singh, 2017). Furthermore, Akaike Information Criterion and Bayesian Information Criterion (BIC) are used to check the consistency of regression coefficients of explanatory variables in the proposed model (Singh, 2017).

4. Empirical Results and Discussion

The statistical summary (i.e., minimum, maximum, mean, standard, skewness and kurtosis) of variables in given in Table 2. The skewness values of most variables (broad money to total reserves ratio and real interest rate) lie between – 1 to + 1. Therefore, all variables are in the normal forms.

Table 2: Statistical summary of the variables

stats	*min*	*max*	*mean*	*sd*	*skewness*	*kurtosis*
gdppc	438.01	2151.73	989.63	507.22	0.86	2.58
bpgdp	34.46	79.08	57.48	15.88	0.12	1.38
bmtrr	3.18	24.02	7.34	4.31	1.91	7.17
dcpspgdp	21.23	52.39	34.62	12.02	0.42	1.38
fcepgdp	65.62	85.77	74.49	6.42	0.36	1.95
cpi	2.49	13.87	7.81	3.03	0.21	2.08
lrat	40.76	76.25	58.14	10.90	-0.04	1.71
rir	-1.98	9.19	5.95	2.36	-1.07	4.65

Source: Estimated by author.

The results of statistical tests which are used to identify the presence of unit root, autocorrelation, multi-correlation and heteroskedasticity in time series in given in Table 3. The Chi^2 values under Ramsay RESET test for dependent and independent variables are found statistically insignificant. Thus, the estimates infer that functional form of linear, log-linear and non-linear regression models are appeared well defined. The Chi^2 values under Breusch-Pagan / Cook-Weisberg and Cameron & Trivedi's decomposition of IM-tests are also observed statistically insignificant. The estimates imply that time series data do not have heteroskedasticity. Furthermore, as per values of Chi^2 under Durbin's alternative test and Breusch-Godfrey LM test, it is found that there is no existence of autocorrelation in the time series data.

Table 3: Results of statistical tests

Model	Linear	Log-linear	Non-linear
Ramsey RESET test using powers of the fitted values of gdppc (Chi^2 value)	22.99	17.38	49.47
Ramsey RESET test using powers of the independent variables (Chi^2 value)	20.23	9.6	20.6
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity (Chi^2 value)	6.14	2.02	7.2
Cameron & Trivedi's decomposition of IM-test (Chi^2 value)	36.1	40.68	54.96
Durbin's alternative test for autocorrelation (Chi^2 value)	20.25	6.329	17.789
Breusch-Godfrey LM test for autocorrelation (Chi^2 value)	15.716	6.807	17.009

Source: Estimated by author.

Table 4: Impact of financial activities of banking sector on per capita GDP

Model	Linear Model			Log-linear			Non-linear		
Number of obs.	39			38			39		
F-Value	280.95			833.16			388.25		
Prob > F	0.000			0.000			0.000		
R-squared	0.9845			0.9949			0.9956		
Adj. R-squared	0.981			0.9937			0.993		
VIF	16.66			17.52			4104.64		
AIC	449.057			-131.5527			413.8656		
BIC	462.3655			-118.452			438.819		
gdppc	*Reg. Coef.*	*Std. Err.*	*P>|t|*	*Reg. Coef.*	*Std. Err.*	*P>|t|*	*Reg. Coef.*	*Std. Err.*	*P>|t|*
bpgdp	-37.894	5.582	0.000	-1.545	0.188	0.000	-6.822	32.874	0.837
bpgdp2							-0.083	0.237	0.729
bmtrr	2.983	3.819	0.441	0.008	0.024	0.728	7.833	20.501	0.706
bmtrr2							-0.252	0.616	0.687
dcpspgdp	43.385	4.688	0.000	1.094	0.081	0.000	40.394	34.013	0.247
dcpspgdp2							-0.363	0.384	0.354
fcepgdp	19.624	5.543	0.001	0.373	0.245	0.138	89.334	130.645	0.501
fcepgdp2							-0.698	0.846	0.417
cpi	-2.614	5.059	0.609	0.001	0.020	0.970	2.421	18.076	0.895
cpi2							-0.039	1.066	0.971
lrat	64.102	3.948	0.000	3.136	0.146	0.000	-176.041	50.543	0.002
lrat2							1.915	0.397	0.000
rir	-3.988	8.082	0.625	0.005	0.023	0.831	7.105	10.055	0.487
rir2							-0.518	0.999	0.609
Con. Coef.	-3500.722	541.743	0.000	-5.159	1.340	0.001	1476.194	5372.556	0.786

Source: Estimated by author.

Regression coefficients of explanatory variables with per capita gross domestic product is given in Table 4. Log-linear regression model produce the better results as compared to linear and non-linear regression model. As *R-square* is found 0.99%, hence 99% variation in per capita GDP can be explained by undertaken variables. The regression coefficient of Broad money with per capita GDP is negative and statistically significant. Thus, the estimate demonstrates the per capita GDP may be declined as increase in broad money in India. However, Broad money to total reserves ratio show a positive impact on per capita GDP in India. Domestic credit to private sector is positively associated with per capita GDP. Thus, the result indicates domestic credit to private sector has a crucial contribution to increase per capita GDP in India. Consumer price inflation and real interest rate also have negative impact on per capita GDP in India. Hence, India needs to control inflation and interest rate to increase per capita GDP at greater scale. The regression coefficient of literacy rate with per capita GDP

is seemed positive and statistically significant. Thus, the estimate clearly infers the literacy rate will play a crucial role to increase the per capita GDP in India. The estimates as per the non-linear regression model indicates broad money to total reserves ratio, domestic credit to private sector, Final consumption expenditure, consumer prices inflation, literacy rate and real interest rate have a non-linear relationship with per capita GDP in India.

5. Conclusion and Policy Suggestions

The prime aim of this study is to examine the impact of banking sector on economic development in India based on existing studies. Thereupon, it assesses the impact of financial activities of banking sector on economic development using empirical analysis. For this investigation, it used per capita GDP as dependent variable, and broad money as a % of GDP, broad money to total reserves ratio, domestic credit to private sector as a % of GDP, final consumption expenditure as a % of GDP, annual consumer prices inflation, literacy rate and real interest rate as independent variables in a time series of 1981-2019.

The regression coefficient of explanatory variables with per capita GDP is estimated through linear, log-linear and non-linear regression models. The results shows that broad money to reserve ratio and Domestic credit to private sector have a positive impact on per capita GDP. Domestic consumption expenditure is also showed a positive impact on per capita GDP. Real interest rate and consumer price inflation have a negative impact on per capita GDP. Hence, it is suggested that India needs to control interest rate and consumer price inflation to increase the demand of goods and service in domestic market. It would be useful to create employment opportunities and accordingly per capita GDP in India. Literacy rate is also an important driver to increase the per capita GDP. As literate person has a greater possibility to be engaged in economic activities as compared to illiterate person. Hence, India requires to create skills among the people to get more jobs in India. Subsequently, it would be conducive to increase per capita GDP in India. The empirical results based on non-linear regression model show that broad money to total reserves ratio, domestic credit to private sector, final consumption expenditure, consumer prices inflation, literacy rate and real interest rate have a non-linear association with per capita GDP. Furthermore, some variables have hilly and U-shaped association with per capita GDP in India.

References

- Alam, Md.S., Rabbani M.R., Tausif M.R. and Abey J. (2021). Banks' performance and economic growth in India: A panel cointegration analysis. *Economies*, 9(38):1-12.

- Al-Homaidi E.A., Tabash M.I., Farhan N.H.S. and Almaqtari F.A. (2018). Bank-specific and macro-economic determinants of profitability of Indian commercial banks: A panel data approach. *Cogent Economics & Finance*, 6(1):1-26.

- Bhatia A. and Mahendru M. (2015). Assessment of technical efficiency of public sector banks in India using data envelopment analysis. *Eurasian Journal of Business and Economics*, 8(15):115-140.

- Deb A. (2019). Operational efficiency and size of commercial banks: A study of the Indian banking sector. *International Journal of Research in Humanities, Arts and Literature*, 7(6):11-20.

- Guru B.K. and Yadav I.S. (2019). Financial development and economic growth: panel evidence from BRICS. *Journal of Economics, Finance and Administrative Science*, 24(47):1-13.

- Jha R. (2020). Banking structure in India. https://lawtimesjournal.in/banking-structure-in-india/.

- Joshi S. (2017). Financial sector development and economic growth in India: Some reflections. MPRA Paper No. 81201. https://mpra.ub.uni-muenchen.de/81201/.

- Jyoti B. and Singh A.K. (2020). Characteristics and determinants of new start-ups in Gujarat, India. *Entrepreneurship Review*, 1(2):1-25.

- Hafsal K., Suvvari A. and Durai S.R.S. (2020). Efficiency of Indian banks with non-performing assets: evidence from two-stage network DEA. *Future Bus J*, 6(26):1-9.

- Hamid N., Ramli N.A. and Hussin A.A.S. (2017). Efficiency measurement of the banking sector in the presence of non-performing loan. AIP Conference Proceedings 1795(020001):1-8.

- Karimzadeh M. (2012). Efficiency analysis by using data envelop analysis model: evidence from Indian banks. *International Journal of Latest Trends in Finance & Economic Sciences*, 2(3):228-237.

- Kumar A., Ahmad M.M. and Sharma P. (2017). Influence of climatic and non-climatic factors on sustainable food security in India: a statistical investigation. *International Journal of Sustainable Agricultural Management and Informatics*, 3(1):1-30.

- Kumar R. (2019). Data envelopment analysis recent applications in banking sector: A survey. *International Journal for Research in Applied Science & Engineering Technology*, 7(11):449-456.

- Kumari J. (2017). Role of bank in the development of Indian economy. *Imperial Journal of Interdisciplinary Research*, 3(1):740-743.
- Liang H.Y. and Reichert A. (2006). The relationship between economic growth and banking sector development. *Banks and Bank System*s, 1(2):19-35.

- Muniswamy D. (2018). Role of commercial banks in economic development: Indian perspective. *IJRAR*, 5(1):645-649.

- Prochniak M. and Wasiak K. (2016). The impact of the financial system on economic growth in the context of the global crisis: empirical evidence for the EU and OECD countries. *Empirica*, 44(1):295-337.

- Puatwoe J.T. and Piabup S.M. (2017). Financial sector development and economic growth: evidence from Cameroon. *Financial Innovation*, 3(25):1-18.

- Rajan R.G. and Zingales L. (1998). Financial dependence and growth. *The American Economic Review*, 88(3):559-586.

- Ruslan A., Pahlevi C., Alaam S. and Nohong M. (2018). Determinants of banking efficiency and its impact on banking competitive advantages. *Advances in Economics, Business and Management Research*, 92, 3rd International Conference on Accounting, Management and Economics, 2018.

- Saeed M.Y., Ramzan M. and Hamid K. (2018). Dynamics of banking performance indicators and economic growth: long-run financial development nexus in Pakistan. *European Online Journal of Natural and Social Science*, 7(3):141-163.

- Sharma S., Raina D. and Singh S. (2012). Measurement of technical efficiency and its sources: An experience of Indian banking sector. *International Journal of Economics and Management*, 6(1):35-57.

- Singh A.K. (2017). An empirical analysis to asses the GDP projection of Gujarat state of India. *JNNCE Journal of Engineering and Management*, 1(2):51-58.

- Singh A.K., Arya A. and Ashraf S.N. (2019). A conceptual review on economic, business, intellectual property rights and science & technological related activities in Asian economies. *JNNCE Journal of Engineering & Management*, 3(2):1-22.

- Singh A.K., Singh B.J. and Ashraf S.N. (2020). Implication of intellectual property protection, and science and technological development in the manufacturing sector in selected economies. *Journal of Advocacy, Research and Education*, 7(1):16-35.

- Singh A.K. and Ashraf S.N. (2020). Association of entrepreneurship ecosystem with economic growth in selected countries: An empirical exploration. *Journal of Entrepreneurship, Business and Economics*, 8(2):36-92.

- Singh A.K. and Jyoti B. (2020). Factors affecting firm's annual turnover in selected manufacturing industries of India: An empirical study. *Business Perspective Review*, 2(3):33-59.

- Singh A.K. and Jyoti B. (2021). Projected food-grain production and yield in India: An evidence from state-wise panel data investigation during 1977-2014. *The Journal of Agricultural Sciences – Sri Lanka*, 16(1):108-125.

- Singh D. and Malik G. (2018). Technical efficiency and its determinants: A panel data analysis of Indian public and private sector banks. *Asian Journal of Accounting Perspectives*, 11(1):48-71.

- Tanwar J., Seth H., Vaish A.K. and Rao NVM (2020). Revisiting the efficiency of Indian banking sector: An analysis of comparative models through data envelopment analysis. *Indian Journal of Finance and Banking*, 4(1):92-108.